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Xerox Corporation
c/o ORTIZ & LOPEZ, PLLC
P. O. BOX 4484
ALBUQUERQUE, NM 87196-4484

EXAMINER	
KAU, STEVEN Y	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/635,381	MALTZ ET AL.	
	Examiner	Art Unit	
	STEVEN KAU	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/25/2008 has been entered.

Response to Amendment

2. Applicant's amendment was received on 11/25/2008, and has been entered and made of record. Currently, claims 1-22 are pending for further examination in this Action.

Response to Remark/Arguments

3. Applicant's arguments with respect to claims 1-22 have been fully considered and the reply to the Remarks/Arguments is in the following:

> Applicant posts the outline of MPEP §2142, recites,
> "The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie

case, the applicant is under no obligation to submit evidence of nonobviousness."

And the U.S. Supreme Court ruling of April 30, 2007 (KSR Int'l v. Teleflex Inc.) case, Recites, "Applicant further notes that the U.S. Supreme Court ruling of April 30, 2007 (KSR Int'l v. Teleflex Inc.) states:

"The TSM test captures a helpful insight: A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. Although common sense directs caution as to a patent application claiming as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the art to combine the elements as the new invention does."

"To facilitate review, this analysis should be made explicit."

In addition, applicant states that, "Regarding claims 1 and 10, the Examiner rejected the Applicant's previously submitted arguments. First, the Applicant continues to assert the arguments offered in previous responses, in defense of these claims are still applicable.

In addition, the Applicant respectfully directs the Examiner's attention to the amendments to claims 1 and 10. Claim 10 now includes the limitation that a transformation module be included within an iterative controller as disclosed in the Applicant's specification. The Applicant respectfully submits

none of the references discloses such an internal structure. Therefore, the Applicant respectfully requests the rejection of claim 10 be withdrawn."

In re, the examiner has responded to applicant that applicant's application examination is based on US patent laws, rules and MPEP guidelines. The examiner had made detail responses in the previous office actions explaining how the claims were examined based on the laws, rules and MPEP guidelines. For example, response recites, "Finally, the applicant argues that "Finally, per the decision in KSR Int'l v. Teleflex Inc., it is not enough that the Examiner identify all elements of Applicant's invention in past references (which the Applicant suggests the Examiner has still failed to do); the Examiner must also explicitly explain the reason one of ordinary skill in the art would have combined the referenced inventions in the way they are taught in Applicant's invention, The Examiner has cited col, 4, lines 17-43 suggesting this discussion explains the motivation for the combination of Shimizu and Mahy as a means for providing each and every claim limitation of Applicant's claims, First, neither Applicant's invention nor Shirnizu ever mentions 'lightness levels' as described by Mahy, This suggests there is no motivation to combine May with Shimizu as a basis for providing each and every claim limitation of Applicant's invention, In addition, the Examiner has failed to explain how the combination of elements supposedly taught by Mahy would improve the Shimizu invention, Specifically, there is no explanation of how a transformation module for automatically reducing a particular dimensional order based on determining which color value among said plurality of color values has attained said

gamut limit, which the examiner claimed is taught by Mahy, would improve the Shimizu invention", last paragraph, pages 9-10.

In re, the examiner disagrees with this assertion. Shimizu discloses a method and a system to convert (or control) an L*a*b* value of a certain color which is outside a target color gamut (Abstract, Figures 8A-B, and col 14, lines 57 to col 15, line 40, Shimizu), and Mahy discloses how to use mathematical models to calculate or determine color gamut. The examiner also disagrees the statement that "First, neither Applicant's invention nor Shimizu ever mentions 'lightness levels' as described by Mahy". First, both the applicant (e.g. Figures 1,2 & 4, Pars. 37-42) and Shimizu (e.g. Figures 5-17, col 10, lines 62-67) use CIE L*a*b* values for color gamut control. It is well known in the art that the value L* in CIE L*a*b* coordinate represents for the lightness of the color. Thus, applicant's statement "neither Applicant's invention nor Shimizu ever mentions 'lightness levels' as described by Mahy" is NOT persuasive. The motivation of combining Shimizu's teaching with Mahy's reference is obvious for obtaining a better or accurate result and the mathematical model provided by Mahy could be implemented into Shimizu's system of Figures 18 & 19 by one ordinary skill in the art at the time the invention was made and predictable result is achievable.

Thus, the examiner meets the three basic criteria in establish a prima facie case of obviousness in this application prosecution:

1. some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;

2. a reasonable expectation of success; and

3. the teaching or suggestion of all the claim limitations by the prior art reference (or references when combined) (MPEP 2143).

As discuss above, same rational basis is equally applied to the arguments with regard to the dependent claims", pages 6-7, Office Action, Final Rejection, dated 8/20/2008.

With respect to the amended claim 10, and 1, the examiner found that the claimed invention is obvious to Shimizu et al (Shimizu) (US 7,167,277) in view of Mahy (US 5,832,109), and claim 9 is obvious to Shimizu et al (Shimizu) (US 7,167,277) in view of Mahy (US 5,832,109), and Holub (US 6,750,992). Thus the claim invention has not yet met the patentability due to obviousness issue.

For instance, with respect to amended claim 10, Shimizu discloses system (**e.g. the system of Fig 18, col 28, lines 5-47**), comprising: a plurality of color values (**such as L255*, a255* & b255* value, corresponding to CMY color data value, col 2, lines 28-59, and as shown in Fig. 5, L*a*b* value is input to the system for process, col 10, lines 10-35**) automatically provided as input to an image processing device (**e.g. L*a*b* values based on the measurement of a patch outputted from the printer corresponding to CYM values are as input initial value; since the L*a*b* values obtained and inputted in the process are not manually performed, thus data is automatically provided as input to the image processing device shown in Figs. 18 & 19; see Figs. 5 & 7, col 11, line 65 to col 12, line 19 for full detail**), wherein said image processing device is under a control of a particular dimensional order (**e.g.**

processing in three three-dimensional arrays, col 13, lines 51-65); a color sensor (**e.g. measurement of L*a*b* values indicates that a color sensor must be used for color measuring, col 11, lines 65-67 & col 12, lines 1-19**) for dynamically determining which color value among said plurality of color values has attained a gamut limit (**e.g. Shimizu discloses a flowchart or algorithm which has a steps to determine shortest distance from boundary of color gamut in Figs. 7 & 9, judging whether color value is near the color gamut boundary which is actively or dynamically performed, col 13, lines 5-37 & col 15, lines 41-66**);

a color sensor (**e.g. measurement of L*a*b* values indicates that a color sensor must be used for color measuring, col 11, lines 65-67 & col 12, lines 1-19**) for dynamically determining which color value among said plurality of color values has attained a gamut limit (**e.g. Shimizu discloses a flowchart or algorithm which has a steps to determine shortest distance from boundary of color gamut in Figs. 7 & 9, judging whether color value is near the color gamut boundary which is actively or dynamically performed, col 13, lines 5-37 & col 15, lines 41-66**); an iterative controller (**e.g. "iterative controller", a controller processes an iteration loop(s); Shimizu discloses an example of the controller of a printer processes color value for each pixel, col 1, lines 24-35, and the processes of Figs. 7, 12 and 13 for generating a color conversion table for printers for converting L*a*b* values to CMY values indicate multiple iteration processes, col 11, line 60 to col 12, line 42, and so on; thus, the controller of a printer must perform iterative loops in the processes of Figs. 7, 12 and 13**); a transformation module (**e.g. conversion table**)

provided inside said iterative controller (**e.g. a conversion table for printer/controller to convert L*a*b* values to CMY values and thus the conversion table is indeed the controller, col 11, line 60 to col 12, line 42**).

Shimizu does not explicitly disclose that a transformation module for automatically reducing said particular dimensional order based on determining which color value among said plurality of color values has attained said gamut limit, thereby providing improved control for colors that are located external to said gamut.

Mahy teaches that a transformation module for automatically reducing said particular dimensional order based on determining which color value among said plurality of color values has attained said gamut limit (**e.g. Mahy discloses an example mathematical model of 3-ink process with one color value c_1 reaches its limit at 0, dimensional order of 3-ink process is automatically reduced to 2-ink process because an n-ink process is completely characterized by its colorant gamut with a number of colorant limitations, col 14, lines 50-64 & col 1, lines 49-58**), thereby providing improved control for colors that are located external to said gamut (**col 7, lines 45-48**).

Having a system of Shimizu' 277 reference and then given the well-established teaching of Mahy' 109 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Shimizu' 277 reference to include a transformation module for automatically reducing said particular dimensional order based on determining which color value among said plurality of color values has attained said gamut limit, thereby providing improved control for colors that

are located external to said gamut as taught by Mahy' 109 reference since doing so would improve the control of an L*a*b* value of a certain color which is outside a target color gamut, and further the mathematical model provided by Mahy' 109 could be implemented by one another with predictable results.

The amended claims 1 and 9 are found obviousness and the rejection is discussed in the following sections of this Action.

The examiner also references the applicant to the claims rejection section below for the explanation on how the prior art references read on the amended claims.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 12, 13, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to claims 12 and 13, limitation recites, "The system of claim 10 wherein said particular dimensional order comprises a three-dimensional order", and "The system of claim 12 wherein said transformation module further comprises a compensation module for reducing said three-dimensional order to a two-dimensional order using a standard International Color Consortium (ICC) framework", respectively. Claim 13 recites the limitation "said transformation module" in claim 12. There is insufficient antecedent basis for the limitation in the claim. See MPEP 706.3(d).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 3-5, 10-12, 14-16 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al (Shimizu) (US 7,167,277) in view of Mahy (US 5,832,109).

Regarding **claim 10**.

Shimizu discloses system (**e.g. the system of Fig 18, col 28, lines 5-47**), comprising:

a plurality of color values (**such as L255*, a255* & b255* value, corresponding to CMY color data value, col 2, lines 28-59, and as shown in Fig. 5, L*a*b* value is input to the system for process, col 10, lines 10-35**) automatically provided as input to an image processing device (**e.g. L*a*b* values based on the measurement of a patch outputted from the printer corresponding to CYM values are as input initial value; since the L*a*b* values obtained and inputted in the process are not manually performed, thus data is automatically provided as input to the image processing device shown in Figs. 18 & 19; see Figs. 5 & 7, col 11, line 65 to col 12, line 19 for full detail**), wherein said image processing device is under a control of a

particular dimensional order (**e.g. processing in three three-dimensional arrays, col 13, lines 51-65**); a color sensor (**e.g. measurement of L*a*b* values indicates that a color sensor must be used for color measuring, col 11, lines 65-67 & col 12, lines 1-19**) for dynamically determining which color value among said plurality of color values has attained a gamut limit (**e.g. Shimizu discloses a flowchart or algorithm which has a steps to determine shortest distance from boundary of color gamut in Figs. 7 & 9, judging whether color value is near the color gamut boundary which is actively or dynamically performed, col 13, lines 5-37 & col 15, lines 41-66**);

a color sensor (**e.g. measurement of L*a*b* values indicates that a color sensor must be used for color measuring, col 11, lines 65-67 & col 12, lines 1-19**) for dynamically determining which color value among said plurality of color values has attained a gamut limit (**e.g. Shimizu discloses a flowchart or algorithm which has a steps to determine shortest distance from boundary of color gamut in Figs. 7 & 9, judging whether color value is near the color gamut boundary which is actively or dynamically performed, col 13, lines 5-37 & col 15, lines 41-66**); an iterative controller (**e.g. "iterative controller", a controller processes an iteration loop(s); Shimizu discloses an example of the controller of a printer processes color value for each pixel, col 1, lines 24-35, and the processes of Figs. 7, 12 and 13 for generating a color conversion table for printers for converting L*a*b* values to CMY values indicate multiple iteration processes, col 11, line 60 to col 12, line 42, and so on; thus, the controller of a printer must perform iterative loops in the processes of Figs. 7, 12 and 13**); a transformation module (**e.g. conversion table**)

provided inside said iterative controller (**e.g. a conversion table for printer/controller to convert L*a*b* values to CMY values and thus the conversion table is indeed the controller, col 11, line 60 to col 12, line 42**).

Shimizu does not explicitly disclose that a transformation module for automatically reducing said particular dimensional order based on determining which color value among said plurality of color values has attained said gamut limit, thereby providing improved control for colors that are located external to said gamut.

Mahy teaches that a transformation module for automatically reducing said particular dimensional order based on determining which color value among said plurality of color values has attained said gamut limit (**e.g. Mahy discloses an example mathematical model of 3-ink process with one color value c_1 reaches its limit at 0, dimensional order of 3-ink process is automatically reduced to 2-ink process because an n-ink process is completely characterized by its colorant gamut with a number of colorant limitations, col 14, lines 50-64 & col 1, lines 49-58**), thereby providing improved control for colors that are located external to said gamut (**col 7, lines 45-48**).

Having a system of Shimizu' 277 reference and then given the well-established teaching of Mahy' 109 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Shimizu' 277 reference to include a transformation module for automatically reducing said particular dimensional order based on determining which color value among said plurality of color values has attained said gamut limit, thereby providing improved control for colors that

are located external to said gamut as taught by Mahy' 109 reference since doing so would improve the control of an L*a*b* value of a certain color which is outside a target color gamut, and further the mathematical model provided by Mahy' 109 could be implemented by one another with predictable results.

Regarding **claim 11**, in accordance with claim 10.

Dependent claim 11 recites identical features as claim 10. Thus, arguments similar to that presented above for claim 10 are also equally applicable to claim 11.

Regarding **claim 12**, in accordance with claim 10

Shimizu teaches wherein said particular dimensional order comprises a three-dimensional order (**e.g. color conversion table is used to store the calculated three-dimensional arrays of C[L][a][b], M[L][a][b] and Y[L][a][b], col 12, lines 30-42**).

Regarding **claim 15**, in accordance with 12.

Shimizu differs from claim 15, in that he does not teaches wherein said transformation module further comprises a transformation module for reducing said three-dimensional order to a one-dimensional order

Mahy teaches wherein said transformation module further comprises a transformation module for reducing said three-dimensional order to a one-dimensional order (**Mahy discloses an mathematical model showing how a 3-dimensional order is reduced to 1-dimensional order, col 12, lines 36-64**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimizu to include a said transformation module further comprises a transformation module for reducing said three-dimensional order to

a one-dimensional order taught by Mahy because it helps to determine the exact boundaries of the color gamut per lightness level from a set of discrete points (col 4, lines 17-43). Therefore, by combining Shimizu with Mahy, a predictable success of controlling out-of-gamut memory and index color can be achieved.

Regarding **claim 16,** recite identical features as claim 15. Thus, arguments similar to that presented above for claim 15 are also equally applicable to claim 16.

Regarding **claim 19**, **in accordance with claim 10.**

Shimizu teaches a color rendering device **(e.g. printer)** associated with said transformation module and wherein said transformation module is integrated with said image processing device **(refer to Figs 6-7 and Figs. 18 & 19, a color conversion table for printer for converting L*a*b* values to CMY values, col 60 to col 12, line 19)**.

Regarding **claim 20**, **in accordance witch claim 10.**

Shimizu an iterative controller's iterative output is input to said color rendering device **(Input/Output Device 25 of Fig. 18 & Printer 32 of Fig. 19)**, such that said iterative output of said iterative controller reflects a plurality of compensated color values requiring correction for rendering variations thereof **(e.g. the process of color transform and compensation is performed for each color value data of each pixel by the controller of a printer, col 1, lines 30-40,; thus the processes of Figs. 5-16, must repeated for each pixel color value data)**.

Regarding **claim 21**, in accordance witch claim 19.

Shimizu teaches wherein said color rendering device comprises a printer (**Printer 32 of Fig. 19**).

Regarding **claim 22**, in accordance witch claim 19.

Shimizu teaches wherein said color rendering device comprises a photocopy machine (**Input/Output Device 25 of Fig. 18**).

Regarding **claim 1**.

Claim 1 is directed to a method claim in which the image process is performed by an image processing device and thus it meets the 35 U.S.C. 101 statutory requirements.

Shimizu discloses a method, comprising:

automatically providing a plurality of color values (**such as L255*, a255* & b255* value, corresponding to CMY color data value, col 2, lines 28-59, and as shown in Fig. 5, L*a*b* value is input to the system for process, col 10, lines 10-35**) as input to an image processing device (**e.g. L*a*b* values based on the measurement of a patch outputted from the printer corresponding to CYM values are as input initial value; since the L*a*b* values obtained and inputted in the process are not manually performed, thus data is automatically provided as input to the image processing device shown in Figs. 18 & 19; see Figs. 5 & 7, col 11, line 65 to col 12, line 19 for full detail**), wherein said image processing device is under a control of a particular dimensional order (**e.g. processing in three three-dimensional arrays, col 13, lines 51-65**);

dynamically determining which color value among said plurality of color values has

attained a gamut limit (**e.g. Shimizu discloses a flowchart or algorithm which has a steps to determine shortest distance from boundary of color gamut in Figs. 7 & 9, judging whether color value is near the color gamut boundary which is actively or dynamically performed, col 13, lines 5-37 & col 15, lines 41-66**); transforming (**e.g. converting**) said particular dimensional order of said color (**e.g. three-dimensional color arrays calculation or conversion, Fig. 7, col 13, lines 51-65**) which was determined to have attained said gamut limit (**e.g. in the third embodiment, judging the distance of a point to be converted in the direction of outward normal to the border line of the color gamut, Figs. 8A-B, col 14, lines 57-67**), in response to dynamically determining which color value among said plurality of color values has attained gamut limit (**e.g. refer to the process of Fig. 7, Step 14 dynamically determine the shortest distance between the point to be converted and the color gamut boundary, col 13, lines 20-50**).

Shimizu does not thereafter automatically reducing said particular dimensional order through use of a dedicated gamut mapping function allowing for an improved estimate of said color based on said reduced dimensional order, thereby providing improved control for colors that are located external to said gamut and maintaining said color's hue.

Mahy teaches automatically reducing said particular dimensional order through use of a dedicated gamut mapping function (**e.g. a surface of colorant in a three-dimensional color space is mapped to the 2-dimensional color gamut boundaries, col 12, lines 35-49**) allowing for an improved estimate of said color based on said

reduced dimensional order (**e.g. Mahy discloses an example mathematical model of 3-ink process with one color value c_1 reaches its limit at 0, dimensional order of 3-ink process is automatically reduced to 2-ink process because an n-ink process is completely characterized by its colorant gamut with a number of colorant limitations, col 14, lines 50-64 & col 1, lines 49-58**); and thereby providing improved control for colors that are located external to said gamut (**Mahy explored the method to improve control of colors that are located outside of the gamut, i.e. classes 2 and 4, col 16, 26 to col 17, line 34**) and maintaining said color's hue (**e.g. maintained constant hue, col 21, lines 10-31**).

Regarding **claim 2**, in accordance with claim 1.

Shimizu discloses wherein a color sensor (**e.g. measurement of L*a*b* values indicates that a color sensor must be used for color measuring, col 11, lines 65-67 & col 12, lines 1-19**) is used in dynamically determining which color value among said plurality of color values has attained a gamut limit (**Shimizu discloses a flowchart or algorithm which has a steps to determine shortest distance from boundary of color gamut in Figs. 7 & 9, to obtain CMY value corresponding to an L*a*b* value based on the measurement value of a patch outputted from the printer; thus the distance between a point whether inside or outside the gamut and the boundary of gamut must be dynamically determined utilizing a color sensor, col 11, line 60 to col 12, line 5**).

Regarding **claim 3**, recite identical features as claim 12, except claim 3 is a method claim. Thus, arguments similar to that presented above for claim 12 are also equally applicable to claim 3.

Regarding **claim 4**, recite identical features as claim 13, except claim 4 is a method claim. Thus, arguments similar to that presented above for claim 13 are also equally applicable to claim 4.

Regarding **claim 5**, recite identical features as claim 15, except claim 5 is a method claim. Thus, arguments similar to that presented above for claim 15 are also equally applicable to claim 5.

Regarding **claim 9**, a method claim in which an image process is performed by an image process device. Thus the method claim meets the 35 USC 101 statutory requirements.

Shimizu teaches a method, comprising: automatically providing a plurality of color values as input to an image processing device **(e.g. L*a*b* values based on the measurement of a patch outputted from the printer corresponding to CYM values are as input initial value; since the L*a*b* values obtained and inputted in the process are not manually performed, thus data is automatically provided as input to the image processing device shown in Figs. 18 & 19; see Figs. 5 & 7, col 11, line 65 to col 12, line 19 for full detail)**, wherein said image processing device is under a control of a three-dimensional order **(e.g. calculating CMY values in three-dimensional arrays**, **S21 of Fig. 7 and col 12, lines 30-42)**; dynamically determining utilizing a color sensor **(e.g. measurement of L*a*b* values indicates that a color

sensor must be used for color measuring, col 11, lines 65-67 & col 12, lines 1-19; in addition, Shimizu discloses a flowchart or algorithm which has a steps to determine shortest distance from boundary of color gamut in Figs. 7 & 9, to obtain CMY value corresponding to an L*a*b* value based on the measurement value of a patch outputted from the printer; thus the distance between a point whether inside or outside the gamut and the boundary of gamut must be dynamically determined utilizing a color sensor, col 11, line 60 to col 12, line 5), and color among a plurality of colors has attained said gamut limit (**e.g. the distance of to the color gamut boundary of the point to be converted is measured; Figs. 6A-B & 8A-B, col 14, line 39 to col 16, line 34**), wherein said determined color is comprised of a plurality of colors cyan, magenta, and yellow representing said three-dimensional order (**e.g. color arrays of C[L][a][b], M[L][a][b] and Y[L][a][b] are calculated, Fig. 7, col 11, line 65 to col 12, line 19**).

Shimizu differs from claim 9, in that he does not teach that transforming said three-dimensional order, in response to dynamically determining which color among said plurality of three colors cyan, magenta and yellow has attained said gamut limit; and automatically reducing said three-dimensional order, thereby providing improved control for colors that are located external to said gamut.

Mahy teaches transforming said three-dimensional order, in response to dynamically determining which color value among said plurality of three color values has attained said gamut limit (**e.g. Mahy discloses an example mathematical model of 3-ink process with one color value c_1 reaches its limit at 0, dimensional order**

of 3-ink process is automatically reduced to 2-ink process because an n-ink process is completely characterized by its colorant gamut with a number of colorant limitations, col 14, lines 34-64 & col 1, lines 49-58); and automatically reducing said three-dimensional order, thereby providing improved control for colors that are located external to said gamut (**Mahy discloses mathematical model of reducing three-dimensional order in col 12, lines 36-64 for improve control of for colors that outside the color gamut as shown in Figs. 11B & 12 B**).

Having a system of Shimizu' 277 reference and then given the well-established teaching of Mahy' 109 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the service portal system of Shimizu' 277 reference to include transforming said three-dimensional order, in response to dynamically determining which color value among said plurality of three color values has attained said gamut limit and automatically reducing said three-dimensional order, thereby providing improved control for colors that are located external to said gamut as taught by Mahy' 109 reference since doing so would improve the control of an L*a*b* value of a certain color which is outside a target color gamut, and further the mathematical model provided by Mahy' 109 could be implemented for one another with predictable results.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al (Shimizu) (US 7,167,277) in view of Mahy (US 5,832,109) as applied to claims 1, and further in view of Terekhov (US 2004/0096104).

Regarding claim 6, in accordance with claim 1.

Shimizu does not disclose wherein a ray-based approach consisting of a ray being drawn from a desired color to a point on a neutral axis through said gamut limit is used to perform said gamut mapping.

Terekhov teaches wherein a ray-based approach consisting of a ray being drawn from a desired color to a point on a neutral axis through said gamut limit is used to perform said gamut mapping (**refer to Figs. 8A, 8B and 9, a ray-based approach consisting of a ray from L*-axis, a neutral axis through gamut limit is used for gamut mapping, Par. 63)**

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimizu and Mahy to include wherein a ray-based approach consisting of a ray being drawn from a desired color to a point on a neutral axis through said gamut limit is used to perform said gamut mapping as taught by Terekhov to improve color mapping of gamut because gamut mapping requires coordinates of the points having the maximal chromaticity for a current gamut boundary (par. 71). Therefore, by combining Shimizu and Mahy with Terekhov, a predictable success of gamut mapping can be achieved.

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al (Shimizu) (US 7,167,277) in view of Mahy (US 5,832,109) and further in view of Terekhov (US 2004/0096104) as applied to claims 6, and further in view of Holub (US 6,750,992).

Regarding **claims 7 and 8**, in accordance with claim 6.

Shimizu and Mahy differ from claims 7 and 8, in that the combination of Shimizu, Mahy and Terekhov does not teach wherein said color sensor comprises an offline sensor and an inline sensor.

Holub teaches wherein said color sensor comprises an offline sensor (**referring to Fig. 3A, and col 11, lines 66-67 & col 12, lines 1-19, an offline sensor, a color measuring instrument, or CMI for measuring the color output of the rendering device)** and an inline sensor **(referring to Figs. 3B-C, and col 15, lines 42-67 & col 16, lines 1-24, an inline sensor, a CMI as a unitary colorimeter SOM 13 take color measurements via lens system by connecting to the fiber optic pickup**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the combination of Shimizu, Mahy and Terekhov to include an offline sensor and an inline sensor taught by Holub to improve communication, control and quality of color reproduction (**col 3, lines 3-15**). Therefore, by combining the combination of Shimizu, Mahy and Terekhov with Holub, a predictable success of controlling out-of-gamut memory and index color can be achieved.

10. Claims 13, 14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al (Shimizu) (US 7,167,277) in view of Mahy (US 5,832,109) as applied to claims 1, 12 and 18 and further in view of Holub (US 6,750,992).

Regarding **claim 13**, in accordance with claim 12.

Shimizu differs from claim 13, in that he does not teach wherein said transformation module further comprises a compensation module for reducing said three-dimensional order to a two-dimensional order using a standard International Color Consortium (ICC) framework.

Mahy teaches wherein said transformation module for reducing said three-dimensional order to a two-dimensional order (**e.g. reducing a 3-dimensioanl color space to a two-color space, col 12, lines 19-32**); and

Holub teaches compensation using a standard International Color Consortium (ICC) framework (**compensation function LUTs to compensate for any non-linearities between light intensity, etc., col 20, lines 4-34 and using the internationally accepted standard, i.e. ICC, col 44, lines 65-66**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimizu to include a said transformation module further comprises a transformation module for reducing said three-dimensional order to a two-dimensional order taught by Mahy because it helps to determine the exact boundaries of the color gamut per lightness level from a set of discrete points (col 4, lines 17-43), and then to modify the combination of Shimizu and Mahy to include compensation using a standard International Color Consortium (ICC) framework. The motivation is to compensate color value difference with a well recognized standard which quantifies color in term s of what normal humans see, rather than in terms of a specific samples or instances of color produced by particular equipment. Therefore, by

combining Shimizu, with Mahy and Holub, a predictable success of controlling out-of-gamut memory and index color can be achieved.

Regarding **claim 14**, in accordance with claim 13.

Shimizu differs from claim 14, in that he does not teaches wherein said transformation module reduces said three-dimensional order to said two-dimensional order in response to determining which colors among said plurality of colors have attained said gamut limit.

Mahy teaches wherein said transformation module reduces said three-dimensional order to said two-dimensional order in response to determining which colors among said plurality of colors have attained said gamut limit (**Fig. 3, col 12, lines 19-32 and col 14, lines 34-64**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimizu to include a said transformation module reduces said three-dimensional order to said two-dimensional order in response to determining which colors among said plurality of colors have attained said gamut limit taught by Mahy because it helps to determine the exact boundaries of the color gamut per lightness level from a set of discrete points (col 4, lines 17-43). Therefore, by combining Shimizu with Mahy, a predictable success of controlling out-of-gamut memory and index color can be achieved.

Regarding **claims 17 and 18, in accordance with claim 10.**

Shimizu and Mahy differ from claims 17 and 18, in that both Shimizu and Mahy do not teach wherein said color sensor comprises an offline sensor and an inline sensor.

Holub teaches wherein said color sensor comprises an offline sensor (**referring to Fig. 3A, and col 11, lines 66-67 & col 12, lines 1-19, an offline sensor, a color measuring instrument, or CMI for measuring the color output of the rendering device)** and an inline sensor **(referring to Figs. 3B-C, and col 15, lines 42-67 & col 16, lines 1-24, an inline sensor, a CMI as a unitary colorimeter SOM 13 take color measurements via lens system by connecting to the fiber optic pickup**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimizu and Mahy to include an offline sensor and an inline sensor taught by Holub to improve communication, control and quality of color reproduction (**col 3, lines 3-15**). Therefore, by combining Shimizu and Mahy with Holub, a predictable success of controlling out-of-gamut memory and index color can be achieved.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Kau whose telephone number is 571-270-1120 and fax number is 571-270-2120. The examiner can normally be reached on M-F, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Steven Kau/
Examiner, Art Unit 2625
2/3/2009

/David K Moore/
Supervisory Patent Examiner, Art Unit 2625